

Appl. No. 10/045,495
Amdt. Dated June 15, 2004
Reply to Office action of March 15, 2004

REMARKS

Claims 1-17 are pending in the application. Claims 1, 9, and 17 stand rejected under 35 U.S.C. 102(a) as being anticipated by KenKnight et al (6,266,563). Claims 2-6, 8, 10-14 and 16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over KenKnight in view of Thompson et al. (5,902,324). Claims 2-7 and 10-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over KenKnight in view of Hartlaub (6,134,470).

The rejection of claims 1, 9, and 17 as being anticipated by KenKnight is respectfully traversed. The Office Action states that "The reference teaches delivering pacing pulses from the left ventricle and then the right ventricle (column 6, second paragraph.) The device also includes sensors from which the pacing pulses would be responsive too." While the KenKnight reference may provide the very limited teaching identified in the Office Action, such teaching is lacking regarding how one would implement antitachycardia pacing in the left and right ventricles. The disclosure in the KenKnight patent is directed primarily to timing for cardioversion and defibrillation (*i.e.*, high voltage and high energy) shocks rather than low energy and low voltage antitachycardia pacing pulses. Further, the claims of the KenKnight patent do not provide teaching regarding the device operation as they appear to be primarily directed to the location of electrodes within the patient's heart. The only discussion of the operation of the device of KenKnight is contained within the paragraph identified in the Office Action, the second paragraph of column 6 which provides:

The antitachycardia pacing may be delivered from the primary electrode placed through the coronary sinus ostium and within a vein on the surface of the left ventricle alone, or may be coupled to or yolked to an additional electrode, such as an electrode positioned in the right ventricle. An independent right ventricle may be provided as an alternate source of antitachycardia pacing, based upon the origin of the trigger and cross-channel syntactic patterns. Antitachycardia pacing may be delivered from the right ventricle and then the left ventricle electrode, or may be delivered from the left ventricle and then the right ventricle electrode.

This language first appears to teach that the antitachycardia pacing can be performed with a left ventricular electrode alone, the left ventricular electrode coupled to the right ventricular electrode or the right ventricular electrode alone. The only suggestion of independent pacing to the left and right ventricles is in the last sentence stating that "**Antitachycardia pacing may be delivered from the right ventricle and then the left ventricle electrode, or may be delivered from the left ventricle and then the right ventricle electrode.**" There is no teaching or suggestion of how this pacing would be controlled or even if the timing is in any way related to sensed signals.

Applicants' claimed invention as presented in independent claims 1, 9 and 17 includes, among other limitations, that the timing of at least one of the pulses to the left ventricle be based on a signal sensed from the left ventricle and that at least one of the pulses to the right ventricle

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be based on a signal sensed from the right ventricle. The KenKnight reference does not provide any teaching or suggestion, either explicitly or implicitly, of how the timing of the antitachycardia pacing to the left and right ventricles is to be controlled. The only relevant teaching is that pacing to one ventricle may come first, followed by pacing to the other ventricle. Without such teaching it is respectfully submitted that the KenKnight patent cannot anticipate any of claims 1, 9 and 17. Withdrawal of the rejection of these claims under 35 USC 102(a) is respectfully requested.

The rejection of claims 2-6, 8, 10-14 and 16 under 35 U.S.C. 103(a) as being unpatentable over KenKnight in view of Thompson et al. (5,902,324) is respectfully traversed. First, the addition of Thompson fails to address the missing teaching discussed above regarding claims 1, 9, and 17. The Thompson patent is not directed to antitachycardia pacing and thus does not provide teaching relative to timing of sensing and pacing for antitachycardia pacing.

Second, as to the assertion in paragraph 6 of the Office Action that KenKnight teaches shorting the electrodes to vary the intensity and direction of the pulse, it is submitted that such configurations are for purposes of the **high voltage shocks** for cardioversion and defibrillation and **not for antitachycardia pacing**. There is no suggestion to use this technique for pacing and it is submitted would not have been obvious to do so as pacing has a significantly different physiologic effect on the heart from high voltage shocks. The only suggestion for combining electrodes for antitachycardia pacing is in the above-quoted second paragraph of column 6 where electrodes from the left and right ventricle are "coupled to or yoked to" each other. There is no suggestion in the KenKnight reference for coupling ring and tip electrodes together for delivering antitachycardia pacing pulses.

Third, for purposes of completeness, while applicants agree that tip and ring electrode systems are known in the art, it is disputed that such an arrangement would "provide more accurate data and results over a single electrode system." It is known in the art that unipolar sensing and bipolar sensing provide different types of information about the electrical activity of the heart, with the unipolar sensing providing a more global or "far field" signal and bipolar sensing providing a more local or "near field" signal. (It is noted that the housing of the pulse generator is used as the second electrode for "unipolar" operation.) One does not necessarily provide more accurate data, just different data depending on the needs of the sensing algorithm.

In view of the above, it is submitted that the teaching of Thompson would not have made it obvious to one of ordinary skill in the art to short the ring and tip electrodes together as asserted in the Office Action. Thus, for all of the reasons discussed above, it is respectfully submitted that claims 2-6, 8, 10-14 and 16 are patentable over KenKnight in view of Thompson. Withdrawal of the rejection is respectfully requested.

The rejection of claims 2-7 and 10-16 under 35 U.S.C. 103(a) as being unpatentable over KenKnight in view of Hartlaub (6,134,470) is respectfully traversed. The combination of KenKnight and Hartlaub suffers from the same shortcomings as those discussed above with regard to the combination of KenKnight and Thompson. Hartlaub does not provide any of the missing teaching. Withdrawal of the rejection is respectfully requested.

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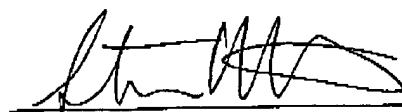
In conclusion, it is respectfully submitted that claims 1-17 clearly distinguish over KenKnight taken alone or in combination with Thompson or Hartlaub. Allowance and passage to issue of claims 1-17 is therefore respectfully requested.

Respectfully submitted,
Mark Kroll, et al.

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PACESETTER, INC.
701 East Evelyn Avenue
Sunnyvale, CA 94086-6527
(408) 522-6101
(408) 738-0285 (fax)

By:



Steven M. Mitchell
Attorney for Applicants
Registration No. 31,857